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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/826,537	04/15/2004	Kwok Wai Cheung	IPVBP004	2147

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EXAMINER	
BLAIR, KILE O	

ART UNIT	PAPER NUMBER
2615	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/826,537	CHEUNG ET AL.	
	Examiner	Art Unit	
	Kile O. Blair	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-16,18-22,24 and 25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-16,18-22,24 and 25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/8/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This Office action is in response to the communication filed on 4/8/2008. Claims 1-3, 5-16, 18-22, 24, and 25 are pending. Claims 4, 17, and 23 are canceled. Claims 1, 5-8, 10, 13, 15, and 16 have been amended and claim 25 is new.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-3, 5-7, 9, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei (US Pub. No. 2001/0007591 A1) in view of Takahashi et al. (US Pat. No. 6,643,377).

Regarding claim 1, Pompei teaches a directional audio delivery apparatus for a system, comprising: audio conversion circuitry that produces ultrasonic signals based on the decoded audio signals provided by a device (a modulator 112 receives a composite audio signal from the summer 110 and an ultrasonic carrier signal from the carrier generator 114, and modulates the ultrasonic carrier signal with the composite audio signal, Pompei, [0022]) and a directional speaker that outputs an ultrasonic output for a user based on the ultrasonic signals (acoustic transducer array 122, Pompei, [0022]) wherein said apparatus further comprises a beam-attribute control unit operatively connected to said directional speaker (delay circuit 120 for applying a phase shift for steering/focusing/shaping the ultrasonic beam, Pompei, [0035]), said beam-attribute control unit being configured to electronically control an attribute of the output of said directional speaker (the delay circuit causes the phased array to vary audio beam characteristics, Pompei, [0039]), wherein the ultrasonic output generates audio output (a suitably controlled phased array may transmit multiple ultrasonic beams simultaneously so that multiple audible beams are generated in the desired directions, Pompei, [0039]), wherein the attribute controlled influences a beam width of the audio output of said directional speaker so that the beam width of the audio output can be changed (audio beam characteristics such as beam width, Pompei, [0039]), and

wherein the beam attribute control unit is configured to change the beam width of the audio output of said directional speaker through electronic, not mechanical, mechanisms (phased arrays may be employed for electronically steering audio beams toward desired locations along selected projection paths, without requiring mechanical motion of the acoustic transducer array 122, Pompei, [0039]).

Although Pompei does not teach the limitation of providing decoded signals, Takahashi et al. teaches a set top box (Takahashi et al., Col. 3, lines 53-57) which inherently provides decoded audio signals to the system which outputs ultrasonic waves (Takahashi et al., Col. 3, lines 44-53). It would have been obvious to use the apparatus of Pompei with any device that receives incoming encoded signals and provides decoded audio signals for use by the system; specifically a set top box as disclosed by Takahashi et al., with the motivation of outputting audio with high directionality as disclosed by Takahashi et al., where the set top box receives an encoded signal and decodes it into an audio signal, at which point the circuitry of Pompei converts it into an ultrasonic signal.

Regarding claim 2, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1, wherein said system is one of an audio system, a stereo system, a television system (set top box, Takahashi et al., Col. 3, lines 53-57), a radio receiver, Digital Versatile Disc (DVD) player, a compact disc (CD) player, and a Video Cassette Recorder (VCR) player.

Regarding claim 3, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei does not explicitly disclose

that the speaker is repositionable with respect to the system in his own invention, Pompei does disclose that the prior art teaches a directional speaker that is repositionable with respect to said system (ultrasonic signal is typically directed along the selected projection path by a mechanical steering device, Pompei, [0006]). It would have been obvious to one of ordinary skill in the art to implement, into the apparatus of Pompei in view of Takahashi et al., the feature of mechanical steering, or repositioning, as disclosed as prior art by Pompei since doing so would have been obvious to try.

Regarding claim 5, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1, wherein the attribute controlled influences the direction of the ultrasonic output of said directional speaker (electronically steering audio beams toward desired locations along selected projection paths, Pompei, [0039]).

Regarding claim 6, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei does not explicitly teach the feature wherein the attribute controlled depends on a remote controller for said audio system, Pompei does teach a computerized beam steering control device. Although Pompei does not explicitly disclose the nature of the device it would have been obvious to one of ordinary skill in the art to use the steering control device as a remote control for controlling attributes of ultrasonic output as that disclosed by Takahashi et al. (commander, Takahashi et al., col. 4, lines 43-51) because doing so would have yielded a predictable result.

Regarding claim 7, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1, wherein said directional speaker has a plurality

of separately controllable regions, and wherein said beam-attribute control unit activates one or more of the controllable regions to control the ultrasonic output from said directional speaker (the acoustic transducers 0-11 [Pompei, 0025] each output an ultrasonic beam simultaneously so that multiple audible beams are generated in desired directions, [Pompei, 0039]).

Regarding claim 9, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1, further comprising one additional directional speaker to create stereo effect (left and right speakers, Takahashi et al., Col. 3, lines 44-53). Although Pompei does not explicitly teach the feature of using two speakers to create a stereo effect, it would have been obvious to one of ordinary skill in the art to use this configuration as disclosed by Takahashi et al. with the motivation of creating a stereo effect which is well known in the art.

Regarding claim 13, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1, wherein said directional audio delivery apparatus further comprises an environmental adjustment unit that is configured to modify the audio signals or the ultrasonic signals in accordance with a piece of information from the environment in the vicinity of a portable device used by the user of said apparatus (the temperature/humidity control device 130 may include a thermostatically controlled cooler, or a dehumidifier that maintains desired atmospheric conditions along the path traversed by the ultrasonic beam based on the preexisting conditions, Pompei, [0044]).

Regarding claim 14, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 13, wherein the piece of information is determined based on a position of the portable device (the preexisting atmospheric conditions are based on the position of the device, Pompei, [0044]), or wherein the piece of information includes a noise level.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Takahashi et al. in further view of Norris et al. (US Pub. No. 2004/0052387 A1).

Regarding claim 8, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei in view of Takahashi et al. does not explicitly teach the feature wherein said directional speaker has a curved surface, which can be a curved emitting surface or a curved reflecting surface, so that the audio output produced is intentionally configured to be non-collinear, Pompei does teach that multiple audible beams may be generated in desired directions (Pompei, [0039]). Norris et al. discloses a speaker with a convex emitter plate comprising an array of cavities that allows sound to be generated over a broad area (Norris et al., [0154]). It would have been obvious to one of ordinary skill in the to use the devices of Pompei and Norris et al. to cause the sound output to be non-collinearly generated in a number of directions since doing so would have yielded a predictable result.

Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Takahashi et al. in further view of Wiser et al. (US Pub. No. 2003/0009248 A1).

Regarding claim 10, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1.

Although Pompei in view of Takahashi et al. does not explicitly teach the feature wherein said apparatus further comprises a personalization unit operatively connected to said audio conversion circuitry, said personalization unit modifies the audio signals or the ultrasonic signals in accordance with an audio characteristic associated with a user of said apparatus, it would have been obvious to one of ordinary skill in the art to utilize the audio processing profiles of Wiser et al. ([0088]) into the set top box of Pompei in view of Takahashi et al. with the motivation of providing a more suitable and personalized audio signal to the individual.

Regarding claim 12, Pompei in view of Takahashi et al. in further view of Wiser et al. teaches a directional audio delivery apparatus as recited in claim 10, wherein the audio characteristic pertains to a hearing characteristic and/or a hearing preference associated with the user (user can edit audio profile using equalizer button, Wiser et al., [0088]).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Takahashi et al. in further view of Wiser et al. and in further view of Brain

(Brain; Marshall, How USB Ports Work, October 11, 2002, www.howstuffworks.com/usb).

Regarding claim 11, Pompei in view of Takahashi et al. in further view of Wiser et al. teaches a directional audio delivery apparatus as recited in claim 10.

Although Pompei in view of Takahashi et al. in further view of Wiser et al. does not explicitly teach the feature wherein the audio characteristic is provided to said directional audio delivery apparatus in a removable, portable data storage device that can be electrically connected to said apparatus, it would have been obvious to one of ordinary skill in the art to store the audio characteristic in a portable USB drive as taught by Brain (storage device, pg. 4, ¶ 5) with the motivation of making the characteristics portable from set top box to set top box.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Takahashi et al. in further view of Tanaka et al. (US Pat. No. 4,823,908).

Regarding claim 15, Pompei in view of Takahashi et al. teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei in view of Takahashi et al. does not explicitly teach the feature wherein the ultrasonic output from said directional speaker is reflected by at least one reflecting surface (ultrasonic wave radiator 8 which reflects of the reflective plate 19 as seen in Fig. 16 of Tanaka et al., col.10, lines 7-21) before propagating into the free space where a user of the apparatus is positioned, as directionally-constrained audio output, it would have been obvious for one of ordinary skill in the art to use the reflective plate of Tanaka et al. with the

directional audio delivery apparatus of Pompei in view of Takahashi et al with the motivation of providing a directional ultrasonic signal to a user with the some attenuation to protect the user from waves that are too powerful and potentially harmful, a concern recognized by Pompei (To reduce the possibility of exceeding an allowable ultrasound exposure, a ranging unit 540 is provided for determining the distance to the nearest listener and appropriately adjusting the output of the adaptive parametric audio system by way of the amplifier, Pompei, [0054]).

Claim 16, 18-20, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Tanaka et al.

Regarding claim 16, Pompei teaches the a method for providing directionally constrained audio to a user using a directional speaker, said method comprising: receiving audio signals to be delivered to the user from an audio device (A modulator 112 receives a composite audio signal from the summer 110 and an ultrasonic carrier signal from the carrier generator 114, and modulates the ultrasonic carrier signal with the composite audio signal, Pompei, [0022]); receiving a beam attribute input (atmospheric conditions, Pompei, [0044]); and driving the directional speaker to generate the directionally constrained audio (acoustic transducer array 122 driven by a signal generator, Pompei, [0022]), wherein the beam attribute input controls at least one attribute of the directionally constrained audio (the temperature/humidity control device 130 may include a thermostatically controlled cooler, or a dehumidifier that maintains desired atmospheric conditions along the path traversed by the ultrasonic beam based

on the preexisting conditions, Pompei, [0044]), wherein the method further comprises converting the audio signals to ultrasonic signals (a modulator 112 receives a composite audio signal from the summer 110 and an ultrasonic carrier signal from the carrier generator 114, and modulates the ultrasonic carrier signal with the composite audio signal, Pompei, [0022]), wherein said driving includes at least driving the directional speaker in accordance with the ultrasonic signals to produce ultrasonic output for providing the directionally constrained audio (A modulator 112 receives a composite audio signal from the summer 110 and an ultrasonic carrier signal from the carrier generator 114, and modulates the ultrasonic carrier signal with the composite audio signal, Pompei, [0022]) and wherein the method further comprises increasing the ultrasonic frequency of the ultrasonic signals so as to increase the width of the beam of the directionally constrained audio (the phased array may be used to generate a frequency-dependent beam distribution, in which modulated ultrasonic beams with different frequencies propagate through the air along different projection paths, Pompei, [0039]; since Pompei discloses different frequencies, whenever the frequency is increased, the beam width inherently increases as well since it is known in the art that ultrasonic waves have decreasing directivity as frequency increases).

Although Pompei does not explicitly disclose the feature wherein the beam attribute input controls a reflector associated with the directional speaker, it would have been obvious for one of ordinary skill in the art to use the reflective surface adjustment mechanism of Tanaka et al. (col. 4, lines 51-59) with the motivation of controlling the strength of the ultrasonic beam.

Regarding claim 18, Pompei in view of Tanaka et al. teaches a method as recited in claim 16.

Although Pompei does not explicitly disclose altering the orientation of the directional speaker, Pompei does disclose that the prior art teaches a directional speaker that is repositionable with respect to said system (ultrasonic signal is typically directed along the selected projection path by a mechanical steering device, Pompei, [0006]). It would have been obvious to one of ordinary skill in the art to implement, into the method of Pompei in view of Tanaka et al., the feature of mechanical steering, or repositioning, as disclosed as prior art by Pompei since doing so would have been obvious to try.

Regarding claim 19, Pompei in view of Tanaka et al. teaches a method as recited in claim 16, wherein the beam attribute depends on a distance or a position of an object (the temperature/humidity control device 130 may include a thermostatically controlled cooler, or a dehumidifier that maintains desired atmospheric conditions along the path traversed by the ultrasonic beam based on the preexisting atmospheric conditions where the preexisting atmospheric conditions are based on the position of the device, Pompei, [0044]).

Regarding claim 20, Pompei in view of Tanaka et al. teaches a method as recited in claim 16, wherein the beam attribute input being received is automatically provided, not based on an input entered by the user (the temperature/humidity control device 130 may include a thermostatically controlled cooler, or a dehumidifier that maintains

desired atmospheric conditions along the path traversed by the ultrasonic beam based on the preexisting atmospheric conditions, Pompei, [0044]).

Regarding claim 22, Pompei in view of Tanaka et al. teaches a method as recited in claim 16, wherein the directional speaker has a plurality of segments to emit the directionally constrained audio; and wherein the segments can be individually controlled for emitting the directionally constrained audio (the acoustic transducers 0-11 [Pompei, 0025] each output an ultrasonic beam simultaneously so that multiple audible beams are generated in desired directions, [Pompei, 0039]).

Regarding claim 24, Pompei in view of Tanaka et al. teaches a method as recited in claim 22, wherein the attribute controls at least one of the many segments to affect the width or the direction of the directionally constrained audio (the temperature/ humidity control maintains desired atmospheric conditions along the path traversed by the ultrasonic beam, from the transducer to the listener, Pompei [0044]).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Tanaka et al. in further view of Fosgate et al (US Pat. No. 5,666,424).

Regarding claim 21, Pompei in view of Tanaka et al. teaches a method as recited in claim 16. Although Pompei in view of Tanaka et al. does not explicitly disclose the feature wherein said method further comprises providing conventional audio, wherein the beam attribute input selects output from either one of the directionally constrained audio or the conventional audio, wherein the audio signals are transformed into ultrasonic signals if directionally-constrained audio is selected, and wherein the audio

signals are not transformed into ultrasonic signals if conventional audio output is selected, it would have been obvious for one of ordinary skill in the art to provide the choice of using conventional audio as disclosed by Fosgate et al. (col. 2, lines 45-53) or the ultrasonic signals disclosed by Pompei with the motivation of providing the user more choices of operation. Additionally, it would have been obvious to provide the user the option to select between a directional speaker and a conventional speaker as each speaker has its benefits and the user would obviously want to use the speaker best suited for the specific application. The option to select between two well known configurations would have been obvious to try when doing so would have yielded a predictable result.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pompei in view of Tanaka et al. in further view of Norris et al.

Regarding claim 25, Pompei in view of Tanaka et al. teaches a directional audio delivery apparatus as recited in claim 1. Although Pompei in view of Tanaka et al. does not explicitly teach the feature wherein the beam-attribute control unit is configured to change the beam width of the audio output of said directional speaker so that the beam width is diverging around the vicinity of the user, Norris discloses a convex configuration of transducers (Norris et al., Fig. 15) and it would have been obvious to one of ordinary skill in the art to configure the transducer array of Pompei in such a manner as that of Norris et al. with the motivation of having the ultrasonic beams diverge around the user after being affected by the temperature/ humidity control device (the temperature/

humidity control device maintains desired atmospheric conditions along the path traversed by the ultrasonic beam, Pompei, [0044]).

Response to Arguments

Applicant's arguments with respect to claims 1-3, 5-16, 18-22, and 24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kile O. Blair whose telephone number is (571) 270-3544. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KB

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